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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/601,321	06/20/2003	Wim Magnus	IMEC278.001AUS	6973
20995	7590	07/29/2005	EXAMINER	
KNOBBE MARTENS OLSON & BEAR LLP 2040 MAIN STREET FOURTEENTH FLOOR IRVINE, CA 92614			COLEMAN, WILLIAM D	
			ART UNIT	PAPER NUMBER
			2823	

DATE MAILED: 07/29/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/601,321

Applicant(s)

MAGNUS ET AL.

Examiner

W. David Coleman

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 02 May 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-20 and 25-30 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,2 and 4-29 is/are rejected.
- 7) ☒ Claim(s) 3 and 30 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Response to Arguments***

1. Applicant's arguments filed May 16, 2005 have been fully considered but they are not persuasive.
2. Applicants contend that Amin et al., U.S. Patent Application Publication No.: US 2002/0121636 A1 herein known as Amin fails to teach or disclose magnetic coupling between adjacent computational elements.
3. In response to Applicants contention that Amin fails to teach magnetic coupling between adjacent computational elements, Applicants are directed to [0012] where Amin clearly discloses that a solid state quantum computer has existed for over ten years using magnetic fields. Amin discloses the coupling of magnetic fields. The last sentence of this paragraph implies that qubits are operated by magnetic coupling.

### ***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

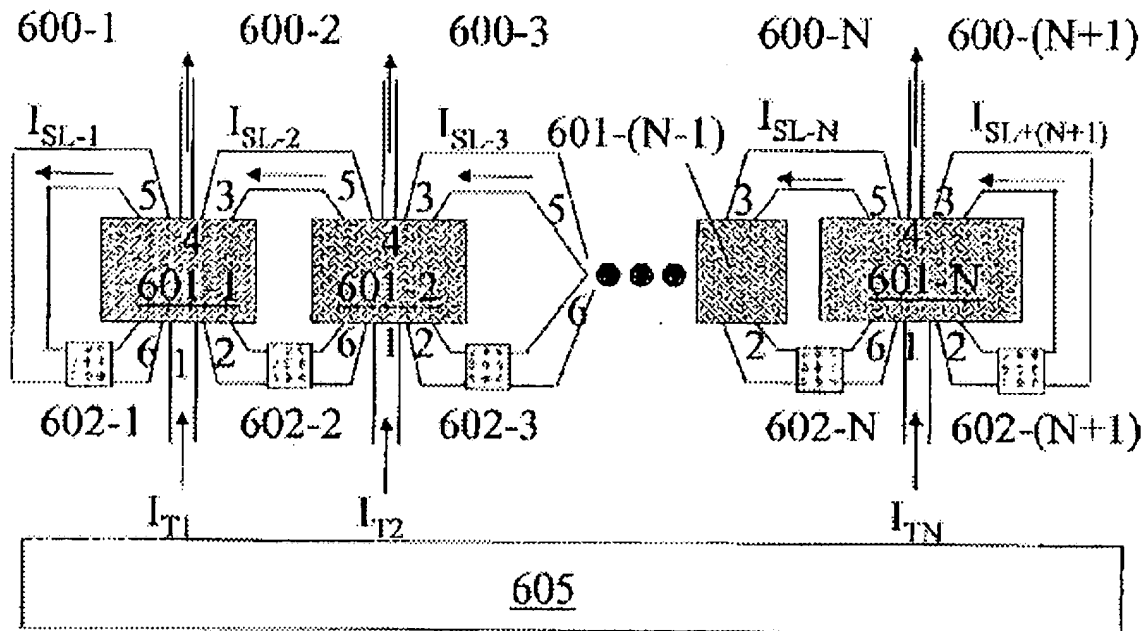
A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1-4, 6-20 and 25-29 are rejected under 35 U.S.C. 102(e) as being anticipated by Amin et al., U.S. Patent Application Publication No.: US 2002/0121636 A1.

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Amin discloses a semiconductor device as claimed. Please see **FIGS. 1A-13** where Amin teaches the claimed limitations.



3. Pertaining to claims 1, 25 and 26 Amin teaches a semiconductor device comprising:

at least two computational elements (600-1, 600-2), each computational element being shaped as a ring-like structure, wherein each computational element is magnetically coupled to at least one adjacent computational element; and an interface structure configured to provide magnetic access [0067] to the computational elements.

4. Pertaining to claims 2 and 27, Amin teaches the device of claim 1, wherein said ring-like structure comprises a ring having a single hole therein.

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5. Pertaining to claims 3 and 28, Amin teaches the device of claim 2, wherein said ring comprises a superconducting material of type I [0070].
6. Pertaining to claims 4 and 29, Amin teaches the device of claim 1 wherein said computational element is magnetically coupled with the at least one adjacent computational element by sharing the core of a transformer [0049].
7. Pertaining to claim 6, Amin teaches the device of claim 1, wherein the interface structure comprises at least one input-output element, and wherein each of said input-output elements is magnetically coupled to an adjacent computational element.
8. Pertaining to claim 7, Amin teaches the device of claim 1, wherein the interface structure comprises:
  - at least one input element and at least one output element, said input element and said output element being magnetically coupled to an adjacent computational element.
9. Pertaining to claim 8, Amin teaches the device of claim 6, wherein said input-output element is configured as a semi-closed ring.

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10. Pertaining to claim 9, Amin teaches the device of claim 7, wherein each of said input element and output element is magnetically coupled to an adjacent computational element by sharing the core of a transformer,

11. Pertaining to claim 10, Amin teaches the device of claim 1, wherein said computational elements are positioned in a two-dimensional array, and at least one of the computational elements at a border of this two-dimensional array is coupled to an input element, and wherein at least one of the other computational elements at the border of this two-dimensional array is coupled to an output element.

12. Pertaining to claim 11, Amin teaches the device of claim 1, wherein each of the at least two computational elements is configured to change its conductive state from superconducting to ohmic conduction in response to a magnetic pulse [0023].

13. Pertaining to claim 12, Amin teaches the device of claim 1, further comprising a circuit configured to provide a current to the input element, and another circuit configured to receive a current from the output element [0097].

14. Pertaining to claim 13, Amin teaches the device of claim 1, wherein the ring-like structure is configured as a closed structure to allow a closed current flow therein.

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15. Pertaining to claim 14, Amin teaches the device of claim 13, wherein the ring-like structure is positioned between the interface structure and another interface structure, and wherein each interface structure comprises a semi-closed ring shaped element.

16. Pertaining to claim 15, Amin teaches the device of claim 14, wherein one of the semi-closed ring shaped elements operates as an input for receiving a time-dependent current signal, and the other semi-closed ring shaped element operates as an output for outputting a current signal [0008] (please note that reading the qbits is equivalent to an output).

17. Pertaining to claim 16, Amin teaches the device of claim 15, wherein the time-dependent current signal is indicative of information in a quantum system.

18. Pertaining to claim 17, Amin teaches the device of claim 1, wherein the computational element comprises a topological space of genus 1.

19. Pertaining to claim 18, Amin teaches the device of claim 1, wherein the device comprises a quantum computer (see Abstract).

20. Pertaining to claim 19, Amin teaches the device of claim 1, wherein each of the at least two computational elements comprises a closed-ring structure having a single hole.

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21. Pertaining to claim 20, Amin teaches the device of Claim 19, wherein the at least two closed-ring structures are magnetically coupled to compute information.

22.

### *Objections*

23. Claims 5 and 30 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

### *Conclusion*

24. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

25. A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.



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26. Any inquiry concerning this communication or earlier communications from the examiner should be directed to W. David Coleman whose telephone number is 571-272-1856.

The examiner can normally be reached on Monday-Friday 9:00 AM - 5:30 PM.

27. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Olik Chaudhuri can be reached on 571-272-1855. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

28. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



W. David Coleman  
Primary Examiner  
Art Unit 2823

WDC